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Science and Communications

Annual Report
1983–84

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April 30, 1985

The Honourable Robert G. Rogers
Lieutenant-Governor of British Columbia

MAY IT PLEASE YOUR HONOUR:

Herewith, I respectively submit the Annual Report of the Ministry of Universities, Science and Communications for the year ended March 31, 1984.

Yours truly

Patrick L. McGeer
MINISTER

April 30, 1985

The Honourable Patrick L. McGeer
Minister of Universities, Science and Communications
Parliament Buildings
Victoria, B.C.

SIR:

I have the honour to submit the Annual Report of the Ministry of Universities, Science and Communications for the year ended March 31, 1984.

Yours truly

Andrew E. Soles
DEPUTY MINISTER

TABLE OF CONTENTS

	Page
MINISTER'S MESSAGE	1
DEPUTY MINISTER'S MESSAGE	2
MINISTRY ADMINISTRATION DIVISION	3
COMMUNICATIONS DIVISION	5
COMMUNICATIONS DEVELOPMENT BRANCH	5
Policy Section	5
Corporate Relations Section	6
Technology Applications Section	8
TELECOMMUNICATIONS SERVICES BRANCH	9
Operations Section	9
Switchboard Services Section	11
Technical Services Section	11
UNIVERSITIES DIVISION	13
THE UNIVERSITIES COUNCIL	13
OPERATING GRANTS	14
OPERATING GRANTS (OTHER)	15
GRANTS — CAPITAL SUPPORT PROGRAM	17
STUDENT AID PROGRAMS	19
SCIENCE AND TECHNOLOGY DIVISION	25
SCIENCE COUNCIL OF BRITISH COLUMBIA	27
SCIENCE GRANTS PROGRAMS	30
BRITISH COLUMBIA RESEARCH COUNCIL	30
DISCOVERY FOUNDATION	32
METRIC AND STANDARDS INFORMATION OFFICE	35

MESSAGE FROM THE MINISTER

This was another year of difficult economic circumstances for the Province. It was one in which both the government and the private sector had to meet the challenge of diminishing revenues and growing responsibilities.

All three of our *universities* performed extremely well this year, despite having to face serious decision about containment of their expenditures. In our *communications* area efforts were continued to introduce common sense to communications policy in our country. The value of British Columbia's "open skies" approach is certainly recognized in all parts of the Province, but particularly in remote communities. Those same communities were assisted this year through our Provincial Educational and Entertainment Television Program, whereby funding is provided to bring the Knowledge Network directly into homes.

In the *science* area efforts were focussed on attracting scientific and research-oriented industry to British Columbia. During the course of the year I personally travelled to high technology centres around the world and met with officials and businessmen in Boston, Massachusetts; California; Ottawa; Edmonton, and Montreal.

In fact, the year ended on a particularly encouraging note when our Ministry, in partnership with the Financial Post, hosted the HI TECH WEST conference. Over 300 attendees had the opportunity of hearing a variety of international speakers and of participating in lively discussion about the need for high technology, the methods by which it can be promoted and policies which all levels of governments should follow in order to reach our goal.

That goal is simple: economic recovery for British Columbia and Canada. To achieve that, our traditional resource-based economy must be broadened to emphasize high technology. My Ministry's mandate is to bring that about.

My thanks go to the dedicated public servants in the Ministry who have given our government invaluable support.

DEPUTY MINISTER'S MESSAGE

In keeping with our Provincial policy of economic restraint few new programs were undertaken in 1983/84. Progress was evident, however, in previously established Ministry initiatives.

Innovation and the development of new technology enterprises were the focus of the Innovation Office and Discovery Foundation. New jobs were created in electronics biotechnology and other technology-based fields.

The Discovery Enterprise Program was introduced, providing a major boost to the development of advanced technology industry.

A new video (MANY FACES IN SCIENCE) was produced by the Science Council in an effort to encourage a greater number of our students to enter the field of scientific research.

B.C. Science and Engineering Awards were presented to leading scientists and engineers in recognition of their contributions to the understanding and appreciation of science and technology.

B.C. Research successfully launched a $2 million contract to commercialize the cerium-based electrochemical procedure to manufacture tetrahydroanthraquinone (THAQ) — a chemical of significant value in the pulping of wood.

A $15 million Pulp and Paper Research Institute (PAPRICAN) was established at the UBC Discovery Park.

A major capital grant of $16 million was approved for the construction of a new Science and Engineering Complex at the University of Victoria.

The growing success of the Knowledge Network of the West Communications Authority — one of the pioneers in distance learning — was aided by the continuing government support of the installation of satellite receiving stations throughout the Province.

The implementation of PROVNET, the government's new telecommunications network, was well under way. Considerable progress was made towards the initial installation of a private telecommunications network that is expected to be the second largest in Canada.

MINISTRY ADMINISTRATION DIVISION

Ministry Administration is composed of the Finance and Administration branch, consisting of the Financial Management Services section and the Personnel Services section, the Executive of the Ministry, their secretaries, 16 support staff, and consultants required for special research projects.

EXECUTIVE OF THE MINISTRY

The Executive of the Ministry is responsible for ensuring that the Ministry's policies, priorities, and program content, determined by the government, are properly administered. Five senior and middle management staff members report directly to the Deputy Minister.

FINANCE AND ADMINISTRATION BRANCH

Roles and Functions

The Finance and Administration branch combines the functions of personnel, systems development, Ministry space requirements, financial management and accounting.

Personnel Services Section

Personnel services are provided to each branch of the Ministry by the Personnel Manager. The personnel office is responsible for providing technical advice and consultation for recruitment and selection of staff, contract negotiations, and administration, application and maintenance of classification systems, occupational health services, and safety programs. In providing support to the Ministry, the personnel office consults with the Public Service Commission and the Government Employee Relations Bureau.

Financial Management Services Section

Financial Management is responsible for all financial accounting and fiscal controls within the Ministry. This responsibility includes providing financial services, coordinating the preparation of the budget, and preparing financial management reports. The section is also responsible for providing office accommodations and coordinating with B.C. Systems Corporation in supplying the Ministry's computer needs.

Accounting responsibilities include preparation of the payroll, processing the Ministry's expenditure and revenue, and maintaining and updating the Accounting Procedures Manual.

The Future

The 1984/85 objectives of the Finance and Administration branch are to:

- update and improve the existing Accounting Procedures Manual; and
- implement specific control policies initiated by the Comptroller-General and Treasury Board.

Ministry Expenditures
Comparison of Fiscal Years

Year	Amount
1983/84	$402 806 493
1982/83	387 594 390
1981/82	356 775 992
1980/81	296 106 151

Summary of Expenditures Related to Estimates

Description of Vote	1983/84 Estimates	1983/84 Actual Expenditure
Minister's Office	$ 119 840	$ 110 421
Ministry Operations	8 641 343	10 372 005
Statutory Appropriation (OIC 1677/83 transfer from MISBD)	4 900 000	
Government Telecommunications (net of recoveries)	27 226 886	26 781 493
Universities	353 394 486	349 542 574
Special Appropriation Act University of Victoria	16 000 000	16 000 000
TOTAL	**410 282 555**	**402 806 493**

COMMUNICATIONS DIVISION

The Communications Division comprises two principal branches: the Communications Development branch and the Telecommunications Services branch.

Generally, the responsibilities of the division are to:

- provide and manage the communications systems required by government ministries and agencies to carry out their assigned responsibilities;
- formulate and implement government policies and regulations which will encourage the orderly development of communications throughout the province;
- support research and development to encourage continuous growth in the telecommunications industry in British Columbia;
- provide grants and consultation services to assist communities to improve their telecommunications services; and
- maintain industry and intergovernmental liaison with respect to provincial and national issues which could jeopardize the realization of maximum benefits from telecommunications for the people of British Columbia.

COMMUNICATIONS DEVELOPMENT BRANCH

The Communications Development branch consists of the Administration, Policy, Corporate Relations and Technology Applications sections, and includes engineers, accountants, economists, policy analysts, and research officers.

The role of this branch is to facilitate action by the Provincial Government to optimize the social and economic benefits of telecommunications for the people of the province. The branch promotes the orderly development of the telecommunications industry in B.C. through recommending and implementing policies, supporting research and development, and acting on behalf of British Columbians in regulatory matters. It administers grants to communities to improve their communications systems, and maintains industry and intergovernmental liaison on provincial and national issues.

Policy Section

Throughout the year the Policy section concentrated on preparing testimony and argument for the legal action challenging federal government jurisdictional claims. This action, initiated in July, 1982 in the Supreme Court of British Columbia, seeks a declaration that the federal government does not have jurisdiction over pay-television operations and the non-broadcast activities of cable companies. By year-end the case had still not come to trial although examinations for discovery had been concluded and notices to admit evidence on numerous aspects had been filed.

The British Columbia Utilities Commission (BCUC), which falls under the jurisdiction of the Ministry of Energy, Mines and Petroleum Resources, continued to hear applications for pay-television and non-broadcast cable operations, and numerous such undertakings were certified. As one aspect of the jurisdictional dispute with the federal government, the BCUC has been subject to a counterclaim filed by the Attorney General Canada and the Canadian Radio-television and Telecommunications Commission, defendants in the legal action previously mentioned.

The Policy section during the year continued to assist individuals or organizations in their efforts to obtain provincial satellite (TVRO) television licensing.

Subsequent to a federal broadcast policy review, the federal government introduced in Parliament a Bill amending the Broadcasting Act. The critical changes included a redefinition of broadcasting which significantly extends the authority of the Act and the CRTC. The Ministry is seriously concerned about the implications of this initiative but considers that a favourable decision in the legal action being brought by the province will strike down the constitutionality of the amendment, should it be passed by Parliament.

Other projects undertaken by the section included the preparation of a policy paper on competition in telecommunications, examination of cellular radio licensing, finalization of the federal-provincial report on Joint Regulatory Mechanisms, and policy reviews and reporting on specific CRTC and Department of Communications actions, in an effort to mitigate any adverse impact upon British Columbia residents.

The policy positions publicized and the actions taken by the Ministry in the matter of satellite signal reception have increased public awareness and helped to stimulate related manufacturing and marketing.

During 1984-85 the matter of inter-exchange competition will require further scrutiny so that a British Columbia policy can be finalized. The policy section will be studying the ramifications of a federal court action initiated by Alberta Government Telephones in response to an application to the CRTC by CNCP Telecommunications for private line interconnection. This case could open up the whole question of federal jurisdiction over telecommunications carriers, whether they are provincially incorporated or not, which in turn would have a direct impact on British Columbia's stated objective of exercising jurisdiction over provincial telecommunications works.

A DOC review of telecommunications policy and CRTC hearings on various broadcast and non-broadcast communications issues will also be closely watched in 1984-85.

Corporate Relations Section

OBJECTIVES

The Corporate Relations section maintains a close overview of the communications industry operations within the province. A broad base of knowledge, contacts and expertise has been established which will form the foundation for future developments. The role of the communication industry in the development of this province cannot be overemphasized. Both the service sector and the manufacturing sector represent valuable resources to be nurtured for the long-term growth and strength of all British Columbians.

During the year, the section pursued its mandate of developing and strengthening contacts with the communications industry of the province. New contacts have been made and established contacts maintained. Both the manufacturing and service sectors of the provincial communications industry have shown resilience in weathering the recent economic recession and establishing excellent prospects for growth.

Under the conditions of rapid change which exist in the telecommunications equipment market the research and development work performed by very small groups of technical experts can produce products with significant world market potential. The Corporate Relations staff were pleased to encourage one such product, in the form of an intelligent telephone terminal, entirely developed in British Columbia and with tremendous world market prospects over the coming years.

The telecommunications equipment market of Japan has been recently officially opened to Canada and the United States. The opportunities which this multi-billion dollar market offers led the Corporate Relations group to establish initial contacts, with representatives from a major Japanese trading house and Nippon Telegraph and Telephone Corporation. It is hoped that such contacts will provide an opportunity for mutual benefits in future years, while it has already introduced a viable routing for small provincial manufacturers into the complex Japanese market.

The telecommunications services in British Columbia remain at one of the highest levels provided anywhere in the world. In September, the staff represented the Ministry at the official ceremony marking the installation of a GTD-5 digital telephone switch, by NorthwesTel, in Fort Nelson. This state-of-the-art equipment was supplied by Microtel of Burnaby, and will introduce the latest in modern telecommunications technology to this remote northern community. Attendance at functions, such as these, provided an excellent opportunity for staff to discuss the problems and prospects of northern service directly with subscribers, senior company officials and operations staff.

DATA BASE

The Corporate Relations section is maintaining a growing data base of participants and activities in the communications industry of this province, which is used as a basis for the development of informed provincial actions in the area of communications.

CONSULTING SERVICES

The section provides an informal consulting service to many groups and individuals both inside and outside of British Columbia. The inquiries cover the broad spectrum of telecommunication activities within the province, and vary from providing the requirements for approved terminal equipment testing laboratories, to providing a static display for a Vancouver conference.

RESEARCH PAPERS

During the year, the section prepared, printed and distributed to various governmental bodies, universities and industrial organizations, a research paper entitled, "Labour and the Location of High Technology Industry: Some Prospects for British Columbia". This paper provides an initial examination of some of the labour factors which influence site selection by high technology companies, and was meant to stimulate further thought and action on this important factor.

SYMPOSIA, SEMINARS, AND EXHIBITIONS

The section participated in the production of an exhibit, co-sponsored by this Ministry and the federal Department of Communications, for the World Communications Year. It was successfully displayed at the Arts, Science and Technology Centre in Vancouver and then toured the province.

The section also participated in the initial development of the agenda for the highly successful Hi-Tech West conference in Vancouver. Co-sponsored by the Ministry and the Financial Post, it attracted 300 delegates and provided a real boost for the industry in British Columbia.

Awards of Excellence for outstanding achievement in the electronics field were sponsored by the Ministry for presentation on behalf of the Electronic Manufacturers Association of British Columbia. The enthusiasm with which the awards were received, combined with the high calibre of the entries, determined the Ministry to participate in the awards again next year.

REGULATORY ACTIVITIES

The section is responsible for telecommunication regulatory activities on behalf of the province. The federal regulatory authority with legislative authority in this area has been initiating an increasing stream of notices and decisions which warrant attention. While attempting to maintain a watch over all the development, the section is restrained in its participation to those issues especially demanding provincial attention.

Technology Applications Section

GENERAL

This section manages the Ministry's communications grant program; performs a major role in Crown land radio site administration; provides a technology resource for the policy and corporate relations sections, other government agencies and ministries, and the general public; and is a resource for information and advice on future technological developments relevant to industrial development and the improvement of communications services throughout the province.

COMMUNICATIONS GRANT PROGRAM

The section administers communications grants which provide financial assistance to communities seeking to improve communications services, and to obtain educational television programming. The rugged terrain of British Columbia and the remoteness of many small communities make the provision of many services uneconomical for commercial enterprise.

A general grants program assists with the capital cost of installations to extend conventional communications services to rural and remote communities, in particular CBC and BCTV television services, and the construction of community-owned facilities. The improvement of terrestrial (microwave) delivery systems has been superseded to a large extent by the introduction of satellite systems.

The Program for Educational and Entertainment Television Services (PEETS grant program) provides assistance with the capital cost of satellite earth receive and distribution systems for education and (some) entertainment television channels available on Canadian satellites. Its principal focus has been the distribution of Knowledge Network educational programming to communities with populations up to 2500.

During fiscal 83/84 PEETS grants were approved for 11 community associations servicing 18,000 households in 58 communities. Grant applications from a further 34 community associations have been received. Overall, 43 PEETS grants have been approved to bring the Knowledge Network to 54,000 households in 193 communities. Staff assistance is provided to communities on an ongoing basis in the development of projects and the preparation of grant applications.

RADIO SITES ADMINISTRATION

The Ministry acts in an advisory role to the Ministry of Lands, Parks and Housing in the administration of Crown land radio sites required by government, commercial and private users. Approximately 1500 such radio sites are now occupied.

As the lead technology agency responsible for planning and management of all communication sites on Crown land, the Ministry aims to ensure their most effective use and to improve service to both government and private users of Crown land sites.

RESEARCH AND DEVELOPMENT

A satellite television signal receiving antenna made of plywood has continued to attract public interest. The antenna, invented by former Deputy Minister Dr. R. W. Stewart, applies optical principles to the reception of microwave signals. The branch has responded to the many requests from the general public for its specifications.

Work to improve and expand the application of this concept resulted in the development of a prototype 4 GHz satellite television fresnel lens, constructed of aluminum, by the Physics Department of the University of British Columbia. Materials for this innovative development were provided through Ministry funding. The concept shows promise for use with future generations of satellites. Further experimental work related to future direct satellite to home broadcasting (DBS) has been sponsored.

Many members of the public solicit the help of the Ministry with problems and deficiencies encountered with communications services. The Ministry provides information and assistance in resolving these problems.

OVERVIEW

Many communities not yet receiving the Knowledge Network have expressed an urgent need for access to it and its educational benefits. As educational television takes its place in the formal education system of this province, we see an increasing need for expanded two-way interactive systems.

The advent of satellite technology has proven a major boost to the improvement of telecommunications services for previously underserved parts of the province. The Ministry will continue its efforts to use this technology to bring educational programming and conventional communications services to remote communities.

A need also exists to deliver conventional radio to remote communities. Investigations for the economical delivery of radio by satellite will be continued, and liaison in support of research, development, manufacturing, and marketing by companies in British Columbia will be expanded.

TELECOMMUNICATIONS SERVICES BRANCH

The Telecommunications Services branch consists of three sections: Operations, Switchboard Services and Technical Services. Its principal role is to provide, in a timely and cost-effective manner, the telecommunications systems and services that the Provincial Government requires to discharge its responsibilities. The services include telephone, data communications, facsimile, radio systems, and auxiliary communications services such as intercoms, paging facilities, sound reinforcement, closed circuit television and Hansard recording.

The branch responded to the government's restraint program requiring this Ministry's staffing cut by 30%. This has been done in spite of the fact that in calendar 1984 and 1985 most members of the branch will be devoting a substantial portion of their time to the implementation of PROVNET, the government's new telecommunications network, which will be the second largest private telecommunications network in Canada. The reduction of staff was planned and undertaken during the last six months of fiscal 83/84. We took advantage of attrition, encouraged early retirements, transferred a number of permanent employees to other ministries, and laid off nine auxiliary employees. In addition, hours of work were reduced for many of our auxiliary employees and job sharing was introduced on the main Victoria switchboard with four full-time employees volunteering to change to half-time status.

Unfortunately, we were unable to maintain our same level and complement of services in the face of this staff downsizing. The switchboard services to individual ministries in Vancouver were reduced, plans to expand the number of clients on consolidated switchboards in other geographical areas were postponed, the hours of service of the Message Centre in Victoria were reduced, and planning was completed to eliminate both the courier service in the government precinct area of Victoria and the public access information service on the main Victoria switchboard on April 1, 1984.

Operations Section

The responsibility of the Operations section is to design, provide, and manage the leased telecommunications facilities required by government.

Continuing restraint, which had a major effect on new construction plans by many ministries, did not reduce the work load of the section because of the demand for modern

automated systems to accommodate downsizing and consolidation of government ministries. Approximately 2,800 orders were processed during the year.

The following were the section's major tasks:

- Planning for the new telecommunications network PROVNET and the continued management of the existing TELPAK system were major projects. Supplier delays necessitated another study of the feasibility of PROVNET which once again supported the requirement now in place. Approval was given to continue. The supplier for the backbone of the system was chosen and work started in some key areas. Because of the size of the project it will be late 1984 before significant relief is provided and late 1985 before the entire network is in place.
- The following message traffic was handled: Telex — 14,405; TWX — 41,658; CNCP wire and cable services — 3,333; and facsimile — 14,950.
- The required services for the Pre-Trial Services Centre in Vancouver were completed.
- The required services for the North Vancouver Courthouse were completed.
- The telecommunications requirement necessitated by the move of the Ministry of Labour into the B.C. Systems Corporation building was planned.
- The required services for the move of the Ministry of Education into new premises were completed.
- Telecommunications services for our own Ministry's consolidation in Victoria were provided.
- Participation in the national program for the protection and restoration of telephone service in an emergency was continued. Commonly referred to as Line Load Control, the program is designed to protect and restore telephone service for designated, essential-service numbers in the event of line overload during an emergency. A list of designated Provincial Government essential-service numbers has been compiled. It is updated semiannually and forwarded to the federal Department of Communications for inclusion in the national program.
- The need to update the government's facsimile transmission service from analogue, six-minutes-per-page machines to the newer digital, forty-seconds-per-page machines has been apparent for over two years. Recent advances in this technology have resulted in cost reductions, and this, plus an increasing awareness on the part of our clients that the use of facsimile will reduce their document transportation costs, have resulted in the decision to begin the improvement of the service. By the end of the fiscal year about 40 older machines had been replaced and 60 new installations were made (at all Government Agents' offices and a number of other locations). The installation of high speed facsimile equipment in the Message Centre has greatly enhanced its capability for rapid transmission of message traffic to those ministries and agencies which currently have facsimile equipment installed, the largest group being Government Agents.

  In the future, other locations are expected to be economically justified as usage goes up and more people are aware of the value of the service.

  Orders have been placed for sophisticated network control hardware and software which will increase the efficiency and control of the service by permitting such features as automated multiple addressing and unattended transmission of documents during late night hours when substantial reductions in long distance rates are in effect.

  The expansion of the service is cost justified as a result of reduction in mail service costs, courier costs, telex, TWX and teletype costs, long distance costs and clerical costs associated with the handling of documents.

Switchboard Services Section

The Switchboard Services section is responsible for the operation of switchboards in ministry offices as well as providing circuit switching for the government's telecommunications network TELPAK. The TELPAK switchboards at Vancouver, Victoria, Prince George, Kamloops, and Nelson are operated by branch personnel with overall supervision being provided from Victoria. Local supervisors also provide support and assistance to personnel operating switchboards in other ministries.

Plans are well advanced for the reorganization and reconfiguration of this section to suit the new environment that will unfold during fiscal 84/85 and 85/86 with the replacement of the present TELPAK network with PROVNET.

Technical Services Section

The Technical Services section is responsible for providing a variety of telecommunications services including network engineering, mobile radio communications, non-SNA data systems and localized auxiliary systems such as intercoms, sound reinforcement, recording and paging to the Legislature. These systems are primarily government owned, engineered and designed for specific purposes by the section. For part of the year assistance was provided to BCBC and the ministries for auxiliary communications but this secondary activity had to be suspended due to an increase in the primary activities.

The following were the section's major tasks:

- An audio teleconferencing trial was instituted on February 15, 1984. Currently, usage is restricted to three ministries of which the Ministry of Health is the principal user. We are currently examining methods of expanding its use within the government which could result in savings in time and money by reducing travel-related meeting costs.
- A data network was developed for the Ministry of Forests. This is a dial-up network which allows for information transfer between Victoria and 68 remote sites within B.C., significantly improving financial management information systems.
- Two data networks were designed and installed for the Ministry of Environment. Firstly, data communication facilities were installed between Victoria and Environment's laboratories at the University of British Columbia in Vancouver. This data network is designed to improve the lab's efficiency by allowing it to be connected on-line with the minicomputer in Vancouver. Secondly, a data network was designed and installed to connect eight sites within British Columbia to the minicomputer system located in Victoria. The initial use of this network is to automate the financial management information system.
- Planning and design assistance for data communications was provided to the Ministry of Transportation and Highways as part of that Ministry's objective to extend office automation to districts and regions.
- Assistance was given to the Ministry of Labour and the Ministry of Consumer and Corporate Affairs in planning their data communications requirements.
- A modification to the data network facilities of the British Columbia Buildings Corporation was designed.
- The joint B.C. Systems Corporation/Telecommunications Services Branch Data Design Team continued to study and propose solutions for improving the cost effectiveness of data communications within the government. One of the major projects of this group is to examine the feasibility of a high speed digital link between Vancouver and Victoria that could be substantially cheaper.

- Participation in the Data Communications Planning Sub-Committee continued. Every ministry within the government is represented at this sub-committee, which is responsible for coordinating data communications systems, policies, and procedures within the government.
- A report entitled "PROVNET: Part 2 — Automation Benefits", dealing with the technological advantages of PROVNET as it relates to productivity, was prepared and submitted to Treasury Board staff.
- The design and tendering of the new computer controlled sound reinforcement, distribution, Hansard recording and logging system for the Legislative Chambers was completed.
- The commissioning of the supervised electronic legislative session bell system was completed.
- Assistance to BCBC for auxiliary communication systems in government buildings within the Province was provided. These include engineering, designing and commissioning of sound reinforcement, paging, intercom and security systems including closed circuit television for the new Kamloops courthouse.
- Design and assistance were given in tendering of auxiliary communications for the Ministry of Highways paging system at the Prince George vehicle maintenance complex and the Ministry of Attorney General intercom and security systems at the Surrey courthouse.
- The installation and commissioning of the B.C. Ambulance Highway 16 radio system was completed.
- The security and portable radio system serving the Pre-Trial Services Centre in Vancouver was completed.
- Upgrading radio equipment and systems expansion of several government agencies, including Fish & Wildlife, Conservation Officer Service, Corrections and the Parks Branch, continued.
- Approximately 3,000 federal Department of Communications licences for government radio equipment were administered.

UNIVERSITIES DIVISION

The Universities Division administers government policy and procedures focussed primarily on the province's three public universities: The University of British Columbia, Simon Fraser University, and the University of Victoria. Grants provided through the Universities Division totalled approximately $349.5 million in 1983/84, 4.2% of the provincial government's total expenditure. This sum includes $301.0 million for general operating purposes, $27.3 million in capital support for buildings and renovations, $12.3 million for specified grants, $8.2 million for student financial aid, and $566,000 for UCBC operations.

The division has three senior officials; the Assistant Deputy Minister of Universities, the Director of University Programs, and the Project Manager of Capital Support. The Assistant Deputy Minister acts as the senior ministry representative on university matters, and interacts at a policy level with the Universities Council, the universities, and other related agencies regarding university operations and program needs. He also liaises with other provincial and federal ministries and departments to ensure program coordination at the university level. The Director assists the Assistant Deputy Minister in coordination of educational plans, policies and programs by preparing formal reports and recommendations; managing special projects; and working with other ministries — especially the Ministry of Education, Post-Secondary Department. The Project Manager assists the Assistant Deputy minister in coordinating ministry responsibilities for the development, implementation and administration of capital plans and projects by preparing five-year plans and annual capital budgets; managing capital expenditures; arranging long-term financing and liaising with appropriate advisory bodies.

THE UNIVERSITIES COUNCIL

The Universities Council is appointed by the Provincial Government as its advisor on university affairs, through the Minister of Universities, Science and Communications. The Council is an independent Crown agency established subsequent to the proclamation of the *Universities Act (1974).* Its autonomous legal status was received through Order-in-Council in 1978.

There are 11 members, including the chairman, Dr. William C. Gibson. No Council member, however, can serve simultaneously as a member of government or university faculty or staff member or student, or a public servant in the provincial ministries of Education, Finance, or Universities, Science and Communications. A member's term of appointment is for three years, and is renewable once, for a similar period. The Council employs eight professional and support staff on a continuous basis and augments them from time to time with consultants for special projects.

The Council serves as an intermediary between British Columbia's three public universities and the Provincial Government. Its purpose is to promote the orderly development of university education and to create public accountability for university expenditures. Some of the Council's most important functions are:

- recommending general funding levels for universities;
- allocating the annual provincial operating grant among the three public British Columbia universities; and
- ensuring that unnecessary duplication of programs is avoided.

The Council's mandate has been extended by the Ministry to include responsibility for reviewing and approving the university-level program of the British Columbia Open

Learning Institute, and academic transfer programs and capital facilities at David Thompson University Centre in Nelson.

Much of the background work for the Council is performed by four standing committees which include university representation at the vice-president level.

The Business Affairs Committee advises council on financial matters with primary emphasis on the budgets of the public universities and the Open Learning Institute (university programs).

The Capital Planning and Development Committee reviews matters pertaining to the universities' capital expenditures including new building projects, public works, renovations, and major equipment.

The Program Coordinating Committee advises the Council on all matters pertaining to academic programs. It evaluates all new program proposals presented by the universities acccording to criteria such as the academic rigour of the curriculum, cost, duplication, and employment opportunities. The committee also helps to coordinate the delivery of distance education programs to non-metropolitan areas of British Columbia.

The Long Range Planning Committee is a committee-of-the-whole which includes the presidents of the three universities and the principal of the Open Learning Institute.

In 1983, the Council launched a Strategic Planning Project, a planning process for the university sector to integrate more thoroughly the academic, financial and physical facility aspects of higher education in British Columbia. A report on the project is scheduled for December 1984.

PROJECTS AND ACHIEVEMENTS

OPERATING GRANTS

Operating grant levels are determined by government after considering the recommendations of the Universities Council and the Ministry. Provincial support for the universities includes a general purpose operating grant and operating grants-other.

The **General purpose grant** represents about 84% of the General Purpose Fund income of the universities. Fees represent a further 13% and the remaining 3% arises from investment and other miscellaneous income. For 1983/84, the general purpose operating grant remained unchanged from the actual level of 1982/83 of almost $301 million. This actual level recognizes the removal of $12 million during 1982/83 as part of the government's restraint program.

When the size of the general purpose operating grant is confirmed, the Universities Council allocates it among the three universities. In the three years preceding 1982/83, a grant allocation methodology was employed which took into consideration the size of the institution, its rate of growth, and the student mix by year and by type of program. For 1982/83, the grant allocation reflected a variation of this earlier methodology and for 1983/84, with no change in the operating grant, the grant allocation remained unchanged as shown in Table 1 below.

TABLE 1

Allocation of General Purpose Operating Grants To Universities, 1982/83 and 1983/84

UNIVERSITY	1982/83	1983/84
University of British Columbia	$180,712,913	$180,712,913
Simon Fraser University	66,564,717	66,564,717
University of Victoria	53,715,662	53,715,662
TOTAL	**$300,993,292**	**$300,993,292**

Each university receives its allocation without restrictions on its autonomy to manage these funds efficiently, taking into account advice from the government and from council.

OPERATING GRANTS (OTHER)

These grants include contributions for the development of programs and projects at the provincial universities and for programs and services provided by other agencies.

For the universities, government policy is to fund special major emerging programs for a limited time period from operating grants-other, and then to transfer the funding responsibility to the universities and the Universities Council through the general purpose operating grant. Table 2 shows the impact of these decisions, comparing the actual expenditures of 1983/84 with those of 1982/83.

TABLE 2

Operating Grants (Other) — 1982/83 and 1983/84
Actual Expenditure

	1982/83	1983/84
Interior Programs	$4,114,000	$3,075,000[1]
David Thompson University Centre	725,000	690,000
Open Learning Institute	1,955,000	1,860,000
Knowledge Network of the West	2,086,000	2,574,597
Engineering Expansion Project	2,000,000	2,750,000
Health Care Teaching Costs	1,170,000	—[2]
Industrial Ed. Teacher Trng.	439,000	—[2]
Library Reconversion	400,000	—[2]
Affiliated Theological Colleges	379,000	360,000
Western College of Veterinary Medicine	721,172	806,760
B.C. Forecasting Committee	7,000	7,000
Chinese Scholar Program Research Support	60,000	60,000
UCBC Grants-Other Projects	86,000	75,000[1]
Miscellaneous Grants	11,061	10,000
TOTAL	**$14,153,233**	**$12,268,357[3]**

[1] The figures shown above also include the following:
Interior Programs — Grants for utilization of KNOW facilities $575,000 ($400,000 in 1982/83); and UCBC Grants—Program for Teachers of the Handicapped, $25,000

[2] As noted in last year's *Annual Report*, funding for certain programs was discontinued in 1983/84. The separate grant for Health Care Teaching Costs was eliminated and the phase-out of designated funding for the Industrial Education Teacher Training was completed in 1983/84. Further, the project grant for the library retrospective conversion of university card catalogues to computer-based microfiche records was not renewed.

[3] In addition to the above, $1,250,000 was provided in 1983/84 for operating equipment purchases, included in the section which follows in capital support.

The Ministry provided funding as specific grants for the following:

- for non-metropolitan programming offered by the universities in all of the major interior and coastal communities and many of the small communities. Some of these programs are offered through the facilities of the Knowledge Network.
- to the Knowledge Network of the West Communications Authority. The Knowledge Network receives funds from both the Ministry of Education and this

ministry. Our funding is to cover the costs of the capital requirements, university programming and the operation of the Network. One of the major components of the last item is the lease cost of the ANIK C satellite which is used to transmit the general interest programs and programs offered by our educational institutions throughout the province.

- for Engineering Expansion — to assist the University of British Columbia to expand its programs in engineering, the University of Victoria to establish its Faculty of Engineering, and Simon Fraser University to develop its program in engineering science.
- to the Open Learning Institute for the provision of university level programs. A total of 46 courses were available in 1983/84. The Open Learning Institute offered 201 different sections of these university-level programs in which there were 3,907 registrants. These represent increases of 18% and 9% respectively.
- to the David Thompson University Centre, established in Nelson in 1979. The centre offers both college programs given by Selkirk College and university-level programs offered by the University of Victoria.
- to the Western College of Veterinary Medicine in Saskatoon to train British Columbia veterinary students in the only program in Western Canada.
- to the affiliated theological colleges, Regent College and the Vancouver School of Theology for post-graduate instruction.
- to the Universities Council as consolidation of funding for a variety of activities and projects of the ministry which are administered by the Council. These include: the Bluma Tischler Post Doctoral Fellowship, the Western Institute for the Deaf, China Scholar Exchange Programs for travel and for research support, and programs for Teachers of the Handicapped.

Enrolment

Growth in enrolment continued at each university during 1983/84. The number of students, both full and part-time, registered for courses in fall 1983 amounted to 52,345, an increase of 1,887 students over the previous year. The number of full-time students grew by 2,086 (6.1%) while part-time student numbers declined by 199 (1.2%).

The number of full-time equivalent (FTE) students for the entire fiscal year amounted to 44,851, an increase of 1,591 (3.7%) over 1982/83. Comparative figures by university by level of study from 1981/82 appear in Table 3, along with information for the Open Learning Institute.

TABLE 3

Full-Time Equivalent Enrolments in Credit Courses
Entire Fiscal Year

	1981/82	1982/83	1983/84
Undergraduate			
UBC	20,207	20,753	21,470
SFU	8,377	9,011	9,175
UVIC	7,284	7,904	8,223
	35,868	37,668	38,868
OLI	464	549	545
Graduate			
UBC	3,644	3,829	4,056
SFU	937	1,055	1,137
UVIC	632	717	791
	5,213	5,601	5,984
Total			
UBC	23,851	24,582	25,526
SFU	9,314	10,066	10,312
UVIC	7,916	8,621	9,014
	41,081	43,269	44,852
OLI	464	549	545
	41,545	43,818	45,397

Source: Universities Council of British Columbia

Roughly 5% of all individuals in British Columbia aged 18 to 44, living in the region of a university, registered in at least one credit course at a university in the past year.

In addition, Table 4 reports the very large number of course registrations in non-credit, continuing education courses of various duration.

TABLE 4

University Continuing Education
Non-Credit Course Registrations

University	Period	Registrations 1981/82	1982/83	1983/84
University of British Columbia	Sept–Aug	76,353	72,170	62,468
Simon Fraser University	May–Apr	21,245	24,476	19,501
University of Victoria	Sept–Aug	16,390	16,636	10,417
TOTAL		**113,988**	**113,282**	**92,368**

GRANTS — CAPITAL SUPPORT PROGRAM

The Capital Support Program supports three main areas:

- purchase of capital equipment items;
- maintenance work and improvements to existing facilities (referred to as renovations and public works projects); and
- construction of new buildings and other facilities.

For capital equipment purchases, the Ministry provides cash grants to each university. These grants allow each university to purchase operating equipment which can range from the equipment required for maintenance of capital plant to essential administrative, instructional and research equipment. In 1983/84, cash grants totalled $1.25 million. The cash grants were allocated according to recommendations of the Universities Council. Table 5 shows cash equipment grants for 1982/83 and 1983/84.

TABLE 5

Equipment Cash Grant

University	1982/83	1983/84
University of British Columbia	$1,250,000	$750,000
Simon Fraser University	405,000	275,000
University of Victoria	345,000	225,000
TOTAL	**$2,000,000**	**$1,250,000**

The government has made a major capital investment in the universities. The present capital plant of the three universities has an insurable replacement value exceeding $1.6 billion. Each year the Ministry provides debentured funding specifically allocated to each university to maintain and make improvements to the existing inventory of facilities. In response to the fiscal situation for 1983/84, capital expenditure allocations were sufficient only to maintain existing capital assets and to undertake a very limited number of primarily minor capital projects.

While the available funds were restricted for renovations and public works projects, the government did grant approvals totalling $4,000,000. The allocations of these funds for 1982/83 and 1983/84 are shown in Table 6 below.

TABLE 6

Renovations and Public Works

University	1982/83	1983/84
University of British Columbia	$2,000,000	$2,600,000
Simon Fraser University	1,000,000	680,000
University of Victoria	1,000,000	720,000
TOTAL	**$4,000,000**	**$4,000,000**

A major portion of the Capital Support Program is devoted to the construction of new facilities. The beginning of the capital process is the five-year plan. Once a year, each university submits its updated five-year plan to the Universities Council. The Council then forwards to the Ministry a consolidated five-year plan as a planning strategy, with projects receiving formal approval on a project-by-project basis. Most projects pass through a two-stage approval process within the Ministry and Treasury Board. At the first stage, a project is approved in principle, and this pre-construction approval funds activities up to the tender documents. At the second stage, funding is approved for building construction and site services.

During the fiscal year, two projects have passed through the two-stage approval process. The costs of these projects are shown in Table 7 below.

TABLE 7

Capital Construction Approvals

University	Project	Estimated Cost	Amount Approved
UBC	Pulp and Paper Centre[1]	$6,000,000	$360,000
UBC	St.Paul's Phase II[2]	5,147,636	5,147,636
TOTAL		**$11,147,637**	**$5,507,636**

[1] This shared-funding project involves significant contributions from the private sector: in particular, the Pulp and Paper Research Institute of Canada.

[2] This project, with an original project cost estimate of approximately $51 million, involves various funding agencies: i.e., Ministry of Health, Greater Vancouver Regional Hospital District, Ministry of Universities, Science and Communications and Ministry of Education. The amount identified above represents the UBC portion of the Medical Academic space to be funded by this Ministry.

During fiscal year 1983/84, approval was granted to the University of Victoria for the construction of the Science and Engineering Complex. A capital grant of $16 million was approved.

Instead of the customary method of debentured borrowing, a trust fund was introduced under the *University of Victoria, Special Appropriation Act, 1984*. Pursuant to this Act, the Province of British Columbia administers a capital account on behalf of the University for funds designated for financing and equipping of the Science and Engineering Complex.

This method of funding may be a forerunner to the development of future financing procedures for government-assisted capital expenditures in the university systems.

During the same 12 month period three capital projects, (the Psychology Building at UBC, medical teaching space in the St. Paul's Hospital Redevelopment Project and the Multi Purpose complex extension at SFU) costing over $21,153,130, were sufficiently complete that they could be brought into use. Part of the St. Paul's Hospital Redevelopment Project — Phase I, included a contribution from UBC.

All costs incurred for building activities, public works and renovations are financed through a two-stage debt-servicing procedure. Tables 8 and 9 provide breakdowns of the authorized capital borrowings and details by project for each university. Since the current capital approval and financing procedures were adopted in 1977, projects with a total worth of $256,525,000 have received approval for borrowing authorization totalling $196,437,000. Against this approved amount, borrowings to date equal $181,447,056. Servicing this debt cost over $27 million in fiscal 1983/84.

STUDENT AID PROGRAMS

Student aid programs are designed to ease the financial burden of those wishing to pursue post-secondary objectives. These programs are administered by the Institutional Support Services, Post-Secondary Department of the Ministry of Education and funded by the Ministry of Universities, Science and Communications. The amount provided for university students in 1983-84 totalled $9,344,000.

British Columbia Student Assistance Program

The Student Assistance Program is a comprehensive program of financial aid for post-secondary students. Its purpose is to ensure that residents of British Columbia are not prevented from reaching their educational goals because of financial limitations.

Although the principal responsibility for meeting educational costs must remain with the student and his/her immediate family, this program exists to supplement the student's financial resources when funds otherwise available are insufficient to cover estimated expenses. A standard needs assessment procedure established by the federal and provincial governments determines the level of assistance for each student based on the number of weeks of study.

The B.C. Student Assistance Program is composed of two interrelated components: the Canada Student Loan Program, and the B.C. provincial grant. The former is funded by the federal government and provincially administered. The program allowed for a repayable loan of $100 per week of studies. For example, for a 16-week course a student could have received up to $1,600 and for a 32-week course up to $3,200. The B.C. provincial grants consisted of a maximum award of $2,000 per educational year for single and married students without dependents and $2,400 per educational year for a single parent and married students with dependents.

Funds are normally disbursed in a combination of non-repayable provincial grant and repayable federal loan. Eligibility for the grant may, however, be limited by factors such as program of study, educational institution, and ownership of assets.

While the vast majority of the students in receipt of either the Canada Student Loan and/or the B.C. provincial grants study at one of the three provincial universities, students in certain programs not available in British Columbia can qualify for the grant as well as the loan.

Table 8 shows the number of awards to university students in 1983–84.

TABLE 8

Number of Awards or Positions
Fiscal Year (April 1, 1983 to March 31, 1984)

University	Federal Loan	Provincial Grant
UBC	5,735	3,533
SFU	2,921	2,105
UVIC	2,099	1,500
DTUC	36	31
Universities outside B.C.	1,536	521
Total	**12,327**	**7,690**

Source: Ministry of Education.

The average federal loan for 1983–84 was $2,470 and the average provincial grant was $942. Table 9 shows the total BCSAP loan and grant expenditures for the years 1980–81 to 1983–84. The total expenditures include awards to university students and students at colleges and institutes.

TABLE 9

B.C.S.A.P. — Loan and Grant Expenditures
Based on Program Year (August 1–July 31)

	1980/81	1981/82	Rate of Growth %	1982/83	Rate of Growth %	1983/84[1]	Growth %
FEDERAL LOAN							
$ Expenditures	$22,243,234	$26,729,492	20.2	$39,389,094	47.4	$55,545,399	41.0
No. of Certificates	16,404	17,825	8.7	25,027	40.4	22,487	(10.1)
Average Award	$1,356	$1,499	10.5	$1,573	4.9	$2,470	57.0
PROVINCIAL GRANT							
$ Expenditures	$11,965,219	$14,852,114	24.1	$23,125,495	55.7	$11,519,468	(50.2)
No. of Confirmations	12,977	13,704	5.6	18,300	33.5	12,228	(33.2)
Average Award	$922	$1,084	17.6	$1,263	16.5	$942	(25.4)

[1] To May 24, 1984.
SOURCE: Ministry of Education.

TABLE 10

Authorized University Capital Borrowings

Under the Capital Financing Authority system, borrowing for a project is usually authorized in two stages: a planning stage and a construction stage. Hence the authorized borrowing for a project may, for a time, be well below the estimated final cost.

Cumulative Totals: March	1980	1981	1982	1983	1984	1984 Percent
SYSTEM ($'000)						
Estimated Costs	$128,420	$166,027	$215,693	$234,701	$256,525	
Authorized Borrowings	$115,115	$134,625	$179,282	$186,753	$196,437	100%
BY UNIVERSITY:						
UBC						
Estimated Cost	78,710	99,301	126,325	133,969	150,717	
Authorized Borrowings	66,230	80,282	106,719	110,809	118,917	61%
SFU						
Estimated Cost	26,254	35,270	54,997	57,058	61,420	
Authorized Borrowings	25,429	29,467	44,752	46,833	47,695	24%
UVIC						
Estimated Cost	23,456	31,456	34,391	43,674	44,394	
Authorized Borrowings	23,456	24,876	27,811	29,111	29,825	15%

NOTE: Prior to 1983, some late borrowing authorizations are not reported until the subsequent year.

TABLE 11

University Debentured Capital Projects

Estimated Cost and Authorized Borrowing Through BCE!CFA[1]
Cumulative From 1976/77 Through 1983/84 — ($000)

	PROJECT	Estimated Cost	(Note)	Authorized Borrowing
UBC				
1	Aquatic Centre	1,000		1,000
2	Library Processing Centre	3,190		3,190
3	Home Economics	5,000		5,000
4	Nursing and Rehabilitation Medicine	3,736		4,110
5	Psychology	11,966		12,150
6	Public Works 1977/78	3,126		3,126
7	Building Renovations 1977/78	2,520		2,520
8	Health Sciences Centre	33,112		33,112
9	Labour Intensive Capital Projects 78/79	5,122		5,122
10	Asian Centre	3,526		3,592
11	Parkade — Acute Care Unit	3,605		3,605
12	TRIUMF I	2,565		2,565
12A	TRIUMF II	4,910		4,910
13	Public Works and Renovations 1979/80	4,766		4,766
14	Public Works and Renovations 1980/81	5,538		5,538
15	Acute Care Equipment	3,085		3,085
16	Chemistry/Physics	14,000		660
19	Public Works and Renovations 1981/82	6,400		6,400
20	Physical Plant I	6,500		390
21	Laurel II	2,900		174
22	Major Equipment 1981/82	3,500		3,500
23	Clinical Medicine	4,904		294
24	Public Works and Renovations 1982/83	2,000		2,000
25	Pulp and Paper Centre	6,000	(360)	360
26	St. Paul's Hospital — Phase II	5,148	(5148)	5,148
27	Public Works and Renovations 1983/84	2,600	(2600)	2,600
	SUBTOTAL: UBC	150,717	(8108)	118,917
SFU				
1	Multi-Purpose Complex	8,600		7,775
2	Teaching and Laboratory Complex	11,455		11,455
3	Public Works 1977/78	1,080		1,080
4	Building Renovations 1977/78	1,515		1,515
5	Labour Intensive Projects 1978/79	810		810
7	Public Works and Renovations 1979/80	2,494		2,494
8	Public Works and Renovations 1980/81	2,250		2,250
9	Central Mall Extension	1,580		1,580
10	Ring Road	6,004		6,004
11	Multi-Purpose Complex Extension	6,106	(182)	6,106
12	Public Works and Renovations 1981/82	3,596		3,596
13	West Mall I	13,500		600
14	Major Equipment 1981/82	750		750

TABLE 11—*Continued*

University Debentured Capital Projects

Estimated Cost and Authorized Borrowing Through BCEICFA[1]
Cumulative From 1976/77 Through 1983/84 — ($000)

PROJECT		Estimated Cost	(Note)	Authorized Borrowing
15	Public Works and Renovations 1982/83	1,000		1,000
16	Public Works and Renovations 1983/84	680	(680)	680
	SUBTOTAL: SFU	61,420	(862)	47,695
UVIC				
1	Clearihue 3rd Wing	885		885
2	MacLaurin Music Wing	3,542		3,542
3	Clearihue 4th Wing	3,000	(−600)	2,994
4	Law Building	6,580		6,580
5	Visual Arts Building	619		619
6	Public Works 1977/78	500		500
7	Building Renovations 1977/78	430		430
8	Labour Intensive Projects 1978/79	665		665
9	Academic Theatre	4,560		4,560
10	Public Works and Renovations 1979/80	2,075		2,075
11	Science and Engineering Complex	15,283		720
12	Public Works and Renovations 1980/81	1,000		1,000
14	Public Works and Renovations 1981/82	1,885		1,885
15	CBC Building	300		300
16	Major Equipment 1981/82	750		750
17	Public Works and Renovations 1982/83	1,600	(600)	1,600
18	Public Works and Renovations 1983/84	720	(720)	720
	SUBTOTAL: UVIC	44,388	(720)	29,825
	SYSTEM TOTAL	256,525	(9690)	196,437

NOTE: Figures in parentheses, included in the authorized borrowing total, represent amounts authorized in 1983/84.

[1] B.C. Educational Institutions Capital Financing Authority.

SCIENCE AND TECHNOLOGY DIVISION

Role and Functions

The mandate of the Science and Technology Division is reflected in the Ministry of Universities, Science and Communications Act, wherein it states (in part) that the Ministry's purposes and functions are

> "to develop policies that will encourage the development and use of science and technology"

On this basis, the Science and Technology Division has declared as its mission the development and establishment of a science and technology support system in British Columbia. Over the past five years, this system has been designed and established to provide an environment — both physical and intellectual — in which scientific research and technological development can flourish and where high technology industrial growth and development can take place.

The division accomplishes the majority of its objectives through the following organizations and programs.

- the Science Council of British Columbia;
- the Secretariat on Science, Research and Development;
- the British Columbia Research Council and its technical operating component, B.C. Research;
- the Discovery Foundation, and its wholly-owned subsidiary Discovery Parks Incorporated;
- the B.C. Innovation Office; and,
- the Discovery Enterprise Program.

Funding provided through the Ministry primarily supports the activities of the Science Council of British Columbia, the Secretariat on Science, Research and Development, Discovery Foundation, Discovery Parks Incorporated, the B.C. Innovation Office and the Discovery Enterprise Program. The Ministry also provides funding to support core research carried on by B.C. Research.

In addition to these organizations, the Internal Research Advisory Committee (IRAC), an intragovernmental committee chaired by the Deputy Minister of Universities, Science and Communications, has been established to review and maintain an awareness of the type of ongoing research and development required by government. An annual statistical survey is conducted to provide information to the IRAC concerning the amount and areas of research and development expenditure funded by the Provincial Government.

The division is also responsible for developing, coordinating, directing, and assessing programs, and making recommendations concerning research program proposals and program alternatives. Assistance is provided to persons and organizations seeking information and direction concerning specific research and development activities and opportunities within the province.

Projects and Achievements

Through the division, the Ministry initiates and promotes special projects involving scientific research and technological development.

Compressed Natural Gas (CNG) As A Transportation Fuel

In 1983/84 the Ministry continued to support the Methane Energy Development Program which has primary responsibility for promoting the use of natural gas as a motor vehicle fuel.

Natural gas is now being used as a primary or as an alternate fuel by over 50 vehicle fleets in B.C. involving approximately 900 vehicles, and its popularity as a vehicle fuel is ever increasing. The most recent sizeable fleet of vehicles to convert to natural gas are those operated by the City of West Vancouver. Interest is high among other municipalities who are encouraged by the potential economic benefits. Lumber and mining industries have also indicated their interest to the extent that Lornex Mines recently announced their intent to convert 72 vehicles at the Logan Lake operation.

Many of the fleet conversions which have taken place over the past year have been prompted through information provided by the Methane Energy Development Program which offers seminars on natural gas conversion throughout the province. Recent seminars have been held in Richmond, Cranbrook, Castlegar, Penticton, Kelowna, Prince George and Terrace. Such meetings have been very well attended by fleet vehicle owners and response to the use of natural gas as a vehicle fuel has been excellent.

A new public natural gas fuelling station opened recently in Prince George with 2 more now under construction in Burnaby, bringing to 7 the present number of public stations in B.C. Other public stations planned for next year will increase this total to 20.

On the basis of the projected economic benefit to the government, Provincial Government vehicles are being considered for conversion to natural gas. This initiative taken by the Ministry, through the Methane Energy Development Program, has the potential of allowing for the conversion of over 1,000 government vehicles throughout the province.

Promotion and awareness in B.C. concerning the use of natural gas as a vehicle fuel has resulted in numerous queries and requests for information not only from within the province, but from other parts of Canada, the United States and other countries throughout the world. The Methane Energy Development Program serves a vital role in providing this information and in supporting the government's interest in promoting the use of natural gas as a vehicle fuel.

Biological and Biomedical Research

The Ministry's intention is that British Columbia become a centre for highly sophisticated biological and biomedical research and development leading, in due course, to new industrial development. With that goal in mind, the Science and Technology Division has continued to work with Discovery Foundation and others to promote and support initiatives related to the development and establishment of a new biological/biomedical industry in B.C. Recent efforts have focussed on the establishment of an Institute of Biological Therapy at the University of British Columbia.

High Technology Program

The use of gallium arsenide (a high quality semiconductor material used as a basis for establishing high mobility integrated circuit, optoelectronic and microwave devices) continues to be viewed as one of the province's areas of opportunity in the high technology field. The division has continued its efforts to encourage the development of a gallium arsenide based microelectronic chip foundry and device manufacturing facility in B.C.

In addition, the division has focussed its attention on 'innovation' as a key to industrial growth and diversification. The recently established B.C. Innovation Office, supported jointly by this Ministry, Discovery Foundation and the Science Council of

B.C., has had tremendous success in its efforts to assist innovators to realize their potential. Over 600 enquiries per month testify to the importance of this program in meeting a real need. Many innovative ideas have been transformed into new products and services and over 100 new manufacturing jobs were created by the 15 small manufacturing companies which started during the year with Innovation Office support.

The Discovery Enterprise Program, which commenced operation in December, 1983, has provided a further boost to the development of advanced and high technology industry in B.C. Over 200 proposals have been included in the program review/approval process since its beginning, of which 13 received approval as at March 31, 1984, for a total commitment of funds in excess of $1.9 million. Continued funding of this program in 1984/85 will ensure that risk capital for the early stages of commercialization of advanced technology products and processes is available. The Discovery Enterprise Program is funded by the Ministry and administered by the Discovery Foundation.

Promotion of Scientific Activities

The government entered a period of restraint in 1983/84 which necessitated a reduction in Ministry funded activities related to the promotion of science and technology in B.C. However, the Discovery Foundation continued with its publication of B.C. R & D and the Science Council of B.C. maintained a public awareness of its programs in support of scientific research and development in B.C. The Minister and Science and Technology staff also played a key role in helping to promote and encourage science and technology in B.C. from a variety of different perspectives and levels of interest.

SCIENCE COUNCIL OF BRITISH COLUMBIA

The Science Council of B.C. and the Secretariat on Science, Research and Development were established in June 1978 under the Science Council of British Columbia Act. The Council and Secretariat report to the Minister of Universities, Science and Communications. Details of Council activities may be found in the Science Council's Annual Report.

The following are members of the Science Council of B.C. (as at March 31, 1984):

Chairman:	Dr. R.A. Nodwell	TIR Systems Limited
	Mr. G.S. Balcom	Senior Vice President, Sydney Development Corporation
	Dr. J.F. Cochran	Dean of Science, Simon Fraser University
	Dr. D.H. Copp	Department of Physiology, University of British Columbia
	Mr. K.A. French	President, Forintek Canada Corporation
	Dr. D.A. George	Dean of Engineering Science, Simon Fraser University
	Dr. J.C. Madden	President, Microtel Pacific Research
	Dr. G.A. May	President, George May and Associates Ltd.
	Mr. D.F. Miller	Chairman, Canadian Fishing Company Ltd.
	Dr. P.C. Trussell	Forest Research Council
	Dr. T.W. Pearson	Department of Biochemistry and Microbiology, University of Victoria
	Dr. G.W. Poling	Head, Department of Mining and Mineral Process Engineering, University of British Columbia
	Mr. S.C. Rooney	President, Durand Machinery Co. Ltd.
	Mr. A.R. Williams	Corporate Vice President, Western Canada, Canadian National Railway
	Dr. W.M. Armstrong	Honorary Member

Appointment is pending for one vacancy.

The following attend meetings but are not members:

Dr. M.A. Cairns, Associate Director, Secretariat on Science, Research and Development;

Dr. J.T. Sample, Executive Director, Secretariat on Science, Research and Development;

Mr. A.E. Soles, Chairman, IRAC, Acting Deputy Minister, Ministry of Universities, Science and Communications.

The Council's members are researchers, research managers, business executives, and senior administrators from both the academic and business sectors, who provide their services on a voluntary basis.

Role and Functions

The principal duties of the Council, as described in the Science Council of B.C. Act, are to:

- consider all matters brought to its attention by the Minister and, where required by the Minister, report its findings to him;
- formulate recommendations respecting the acquisition, development, and dissemination of scientific, technological, and scholarly knowledge to promote the industrial, economic, and social development of the province;
- advise the government on implementation of science policy;
- gather and organize information on scientific research;
- facilitate discussions on science policy with the Government of Canada, another province or an interested person;
- recommend the establishment and awarding of fellowships, scholarships, exhibitions, bursaries, grants, and prizes to encourage development of improved technology and retention of skilled research personnel in the province; and
- evaluate research and development proposals submitted to the Council by the Secretariat, and make recommendations to the government respecting the funding of these proposals.

Research and Development Policy

The objectives of the Council's research and development policy for British Columbia are to:

- consolidate and expand employment and productivity of existing industries by establishing, maintaining, and improving their competitive position — especially in export markets — with particular attention to the maintenance of long-term productivity of the province's forests, mines, agricultural lands, and waters, and to the further development of fossil fuel resources;
- stimulate new industrial opportunities in the province through the establishment of technology-based manufacturing and service industries;
- improve the quality of life in the province by providing, through health-care research, the finest medical services at the most reasonable cost by reducing industrial and urban pollution and by protecting the natural environment from lasting damage; and
- facilitate in all recognized disciplines, the accumulation of scientific and technological excellence in the region and, in so doing, provide opportunities for young people who are receiving advanced training in our educational system, to become involved in the social and economic development of the province.

Projects and Achievements

Awards

The Graduate Research Engineering and Technology (GREAT) Awards are designed to encourage graduate students to work on research projects for local companies. The awards provide a scholarship of $11,500 per year for a maximum of three years to graduate students at British Columbia universities who are working on projects in cooperation with local industries and organizations. During the past year, 29 scholarships were renewed and 17 new awards were made, together worth a total of $529,000.

The Industrial Post-Doctoral Fellowship (IPDF) is designed to stimulate the employment of recent doctoral graduates in private industry. The award provides a subsidy of $25,000 per year (1983/84) for a maximum of two years to the salary of a recently qualified PhD employed with a British Columbia company. This is to provide an incentive for companies to develop their research capabilities, and allow an easy transition from an academic background to an industrial one for the award holder. During the past year, 6 fellowships were awarded.

The B.C. Science and Engineering Awards are annual awards recognizing the contributions of local scientists and engineers to the economic and social development of British Columbia, including contributions to the understanding and appreciation of science by the public. Awards are made to both senior researchers who have made extensive career contributions, and younger investigators who have made an outstanding contribution. A gold medal and citation are presented to each award recipient. A maximum of three awards may be made in any year from among the following categories: natural sciences, health sciences; engineering and applied sciences; industrial innovation.

The 1983 B.C. Science and Engineering Gold Medals went to Dr. John C. Brown, Department of Physiology, University of British Columbia; Drs. David Crampton and John B. Hutchings of the Dominion Astrophysical Observatory near Victoria; and Dr. John Hayward, Department of Biology, University of Victoria.

Secretariat on Science, Research and Development

The primary responsibility of the Secretariat is to provide administrative services to the Science Council, such as the preparation of material for meetings, implementation of Council programs, response to public enquiries, and the financial administration of Council affairs. In particular, the Secretariat has established and coordinates the procedures for the evaluation and funding of research projects, GREAT graduate scholarships, and industrial post-doctoral fellowships.

The secretariat provides a similar service to the B.C. Health Care Research Foundation, which makes awards available for the support of medical and health care research related to provincial concerns.

The Secretariat also attends meetings of the Internal Research Advisory Committee.

Liaison is maintained with the federal government and its agencies, such as the Ministry of State for Science and Technology, Statistics Canada, the Department of Supply and Services, the National Research Council, and other provincial governments and research organizations.

Other Activities

The Science Council met ten times during 1983/84. All but one of those meetings were in the offices of the Research Secretariat in Richmond. The other was, by invitation, at the new Microtel Pacific Research facility in Discovery Park adjacent to Simon Fraser University.

Several Council members toured the Bamfield Marine Station on the west coast of Vancouver Island in May, where they had a chance to view some of the aquatic sciences projects being supported by grants from the Council. Later in the year, the Council received and published a major report on Aquaculture, prepared for it by Envirocon Ltd. of Vancouver. The report, which reviewed both the present state and prospects for aquaculture enterprises in British Columbia, received wide circulation and extensive comment.

A Science Council book prize was established for presentation to the top grade twelve science student in every British Columbia school district. Because of the enthusiastic reception given this initiative, plans are to make this an annual award. A new video production, "Many Faces in Science", was produced with the intention of encouraging more students to enter the field of scientific research and to explain the opportunities for research in their home province.

The Council's grant to the Arts, Sciences and Technology Centre in Vancouver helped the society operating the facility to hire its first executive director, Dr. Robert Bell.

The Council maintained its strong support for the B.C. Innovation Office, which it helped establish in 1982. The Executive Director of the Research Secretariat, Dr. J.T. Sample, continued as Chairman of the Advisory Committee that oversees the activities of the Office.

SCIENCE GRANTS PROGRAM

Through the Ministry's support, a research fund has been established by the Council to award grants for research projects consistent with the Council's stated objectives.

Subcommittees of the Science Council, composed of individuals involved in academic and industrial research, assist the Council by reviewing applications and making recommendations for the support of the most promising projects in various categories. Competitions for research grants take place twice a year.

Two competitions for research grants were held during 1983/84. A total of $3,390,436 was awarded through Research Competition Number Eight (RC-8) and Research Competition Number Nine (RC-9). Awards from the two competitions supported 61 projects of which 37 were renewals and 24 new awards. These are published in the 6th Annual Report of the Science Council of British Columbia, copies of which are available from the Secretariat, on request.

BRITISH COLUMBIA RESEARCH COUNCIL

The British Columbia Research Council is an independent non-profit society, incorporated in 1944 under the Societies Act of British Columbia. The Council has an operating component, B.C. Research, which has staff and facilities to conduct scientific research, engineering and other technical work. In 1970, the Council created a wholly-owned subsidiary company, Techwest Enterprises Ltd., to transfer the sophisticated technological products developed by B.C. Research and other research groups into the marketplace.

The Council is comprised of approximately 75 people who are actively involved or interested in the advancement of science and technology; 21 members serve on the Board of Management and, with the Executive Director, direct the operations of B.C. Research. The members of the Board are drawn from industry, the provincial and federal governments, universities, labour, and staff of B.C. Research. Techwest Enterprises has its own Board of Directors and acts independently.

Role and Functions

B.C. Research works towards the practical application of science and technology for industrial development. Within British Columbia it maintains close working relationships with industry and government and generates most of its operating revenue through the performance of specific contract work. In 1983, more than 70% of the $7.5 million revenue for B.C. Research was obtained through contracts.

The Ministry provides supplementary funding to B.C. Research in selected areas of research that have particular relevance to the Province. During 1983, the main core research areas were in fisheries technology and biotechnology. A portion of the Ministry funding is used for initial investigation of new areas of activity and the balance toward the cost of providing research assistance, problem solving and technology application within B.C. industry, particularly to smaller manufacturers and processors.

Projects and Achievements

Contract Research

Collectively the eight operating divisions of B.C. Research generated $5.5 million of contract work during 1983 from British Columbian, Canadian and international clients. Areas of expertise have been developed over the years and substantial projects were carried out in areas as diverse as bulk handling, solar heating systems, energy research, port studies, environmental monitoring and ocean engineering. Industry consortia support major ongoing programs in extractive metallurgy and in industrial health.

The single largest contract awarded in 1983/84 was for $2.0 million over two years with Pacific Northern Gas of Vancouver. The focus of this project is to commercialize a cerium-based, electrochemical procedure to manufacture tetrahydroanthraquinone (THAQ) which is a chemical of value in the pulping of wood. The key to the process is a novel procedure for oxidizing cerium to its 4 + valence state. The procedure used in the contract work was invented and evaluated at B.C. Research using funding from the Ministry and was then tested on a laboratory scale through support from the Science Council of British Columbia.

A majority of contracts at B.C. Research are of smaller value and service is delivered to a wide range of industry.

Fisheries Technology

Ministry funding supports the fisheries technology program as a core area to provide free technical information and assistance, and to carry out research for the processing sector of the B.C. fishing industry. The program is now in its fifth year of operation. During the past year, a manual was produced concerning safe operating practices for the salmon canning industry. The manual has been issued and now is adopted by the industry.

Other detailed reports have been prepared and issued to the industry on various topics of practical importance. These include a study on the theory and practice of ice glazing; a report on pre-freezing factors that influence the quality and price of herring roe; an evaluation of mechanical oyster opening systems and reports on salmon roe processing. The staff undertake regular plant visits to provide assistance with operating problems and handle inquiries from the industry concerning a wide range of topics.

To counter increasing competition to the B.C. industry from Alaska and from aquacultural salmon produced in Norway, the fisheries technology program is being focussed on providing information and assistance that will allow our processors to diversify their product line, enhance quality and thus compete effectively in world markets.

Biotechnology

The Biotechnology group carried out a core research program to evaluate production of exotic mushrooms on low cost growing media such as the sludges produced by pulp mills. With the oyster mushroom, *Pleurotus sajor-caju*, the research results on cultivation techniques have been taken to the point of commercial development. Several growers were introduced to the technology required for the successful cultivation of oyster mushrooms and were given spawn for start-up operations. Using this technology, one Victoria company is now building a 600,000 lb/year farm in Hawaii and is planning two 500,000 lb/year farms for the Fraser Valley. Several growers have initiated commercial cultivation in farms at Ganges, Fort Langley, Gibsons and Oliver.

Good yields were also obtained when the techniques developed for growing oyster mushrooms were modified and used to grow a second commercially important exotic mushroom, the Shaggy Mane (*Coprinus comatus*).

Private commercial interests can now take over the production of these exotic mushroom species. B.C. Research has produced eight publications that are available to industry and will continue to assist the industry by providing technical help, particularly concerning the manipulation and enhancement of the growing medium to ensure that farmers obtain good product yields.

The biotechnology program is now considering new projects relating to fungi and also to advanced fermentation technology. This work will involve ministry funding together with support from the National Research Council and will be directed towards topics of potential importance to British Columbia.

Technology Development in B.C. Industry

For many years, B.C. Research has worked with B.C. manufacturers and processors to solve practical operating or production problems and to assist in the application of relevant technological innovations to improve productivity. The objective of the work is to increase the technological capability of B.C. industry in a cost-effective manner.

Funds from the Ministry supplement funds from the National Research Council to support seven professional staff who work full-time in the area of technical assistance and technology development. They call upon members of the operating divisions of B.C. Research for specialized expertise, advice and support services and, where appropriate, will contract work to the universities, consultants or industry. As business in British Columbia, particularly the smaller and medium-sized manufacturers and processors, diversifies and competes on national and international markets it is expected that this program will become even more important.

DISCOVERY FOUNDATION

Discovery Foundation was established in 1979 by the Government of British Columbia, through the Ministry of Universities, Science and Communications, as a non-profit society to promote the establishment of a new climate of entrepreneurship and innovation in exciting new areas of advanced technology and the overall future benefit of British Columbia's economy. The Foundation also works towards broadening and strengthening the economic base of the Province by enhancing the establishment and growth of scientific and technological industries, skills and expertise with local and world markets.

The Board of Trustees of Discovery Foundation is as follows:

*Mr. G.H.D. Hobbs	(Governing Trustee) Corporate Director
*Honourable P.L. McGeer	Minister of Universities, Science and Communications Province of British Columbia
The Hon. G.C. van Roggen	Senator, Govt of Canada

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Mr. G.F. Gibson, Jr.	President, Gibson & Clark Properties
Dr. R. Parkinson	Doctor of Psychiatry
Mr. D.M.E. Hamilton	Corporate Director
*Mr. T.J. Ryan	(Treasurer) President, Willow Creek Equities Ltd.
*Mr. D.J. Saxby	(Executive Trustee) President, Pacific Isotopes & Pharmaceuticals Ltd.

(* Denotes Directors of Discovery Parks Incorporated).

Although early Foundation activity centred on the development of four Research Parks through its wholly-owned subsidiary, **Discovery Parks Incorporated**, activities have expanded into the creation of new programs of support for "Innovation".

The B.C. Innovation Office was established, the government's new **Discovery Enterprise Program** is administered, and the Foundation is actively involved in developing major products in electronics, biotechnology, and other technology enterprises. These projects are expected to create 3,500 jobs, $286 million in sales, and capital investment of $337 million by 1989.

Discovery Club meets regularly on a monthly basis in Vancouver and Victoria. The meetings provide opportunities to establish new networks between researchers in private industry, universities, and those with entrepreneurial skills or industrial needs. Chapters are being established in regional centres, and membership has reached nearly 700.

Technology publications include a bi-monthly BC*R&D newsletter that has national and international distribution of 15,000. Recently, consideration has been given to a 32-page dual coloured publication on major scientific and technology related activities in British Columbia, called B.C. Discovery magazine.

Discovery Parks Incorporated

Discovery Parks Incorporated, a wholly-owned subsidiary of Discovery Foundation, was created to develop research parks adjacent to the principal education centres in the province — the University of British Columbia, Simon Fraser University, the University of Victoria, and the British Columbia Institute of Technology. The Discovery Parks are designed to:

- stimulate development of high technology industries within the province;
- encourage the growth of research and development;

- promote an interaction between tenants of Research Parks and the students and faculty of adjacent learning institutions;
- provide employment opportunities for graduate students; and
- provide a bridge between scientific innovation and industrial application of high technology.

The following criteria form the basis for approval of organizations wishing to take advantage of locations in the Parks:

- operations in the Parks must be primarily concerned with research and technology;
- research or technology related to products designed for the destruction of human life will not be permitted,
- product manufacturing or assembling shall be limited to developments,
- pilot plants will be permitted in which processes planned for use and production elsewhere can be tested; and,
- only nuisance-free, clean operations will be permitted.

Since its inception in 1979 the Discovery Parks concept has rapidly expanded in acreage developed, capital facilities constructed, and jobs created. As of 1983, 240 acres were under development in Parks adjacent to the three major post-secondary facilities in greater Vancouver. Every effort is being made to encourage the establishment of a fourth Park at the University of Victoria. Total capital expenditures over three years amount to in excess of $50 million in either completed or committed facilities.

The Multi-Tenant Research Facility located at the Discovery Park, B.C.I.T., enjoyed a fully leased situation as at the end of the 1983 fiscal year. Thirty-four advanced technology companies, some of which are leaders in their field, are in place with a further six companies in the process of constructing their newly-acquired premises. Discovery Parks continues to provide support services to assist the "start-up" companies through their difficult incubator period. The tenants in this facility presently employ — or will as of mid-1984 at full occupancy — approximately 350 persons in research, development and administrative positions.

Microtel Pacific Research Ltd., at Discovery Park, Simon Fraser University, has within one year of occupancy of their facility expanded their requirements to include a present total of approximately 300 staff. It enjoys an ever-expanding interaction with the faculty and student members of the University.

At the UBC Discovery Park the Pulp & Paper Research Institute of Canada (PAPRICAN) has undertaken to construct its western research laboratory. The $15 million project is currently in its design phase, with on-site construction activities scheduled to take place in August, 1984. Occupancy will occur in late 1984, and the Institute will employ in excess of 100 research and development staff.

The new federal Scientific Research Tax Credit (SRTC) legislation has provided a stimulus for research and development activity. This has become apparent in the rapid leasing of the Multi-Tenant Research Facility, and the number of enquiries received by Discovery Parks to construct new owner-occupied facilities at each of its locations.

In keeping with the Discovery Park concept of locating private sector research groups adjacent to centres of knowledge and expertise, and to assist in regional technological development, Discovery Parks Incorporated will shortly be undertaking the construction of an Aquaculture Centre for research and development purposes on the Federal Pacific Biological Station lands in Nanaimo, B.C. In addition, the Powell River Aquaculture Station has been established at Lund, B.C., as a field location to assist mariculture development in the region.

Discussions continue with other regional authorities to establish technological development centres in such areas as Vernon, Kamloops and Prince George.

METRIC CONVERSION AND STANDARDS INFORMATION OFFICE

Canada's Metric Conversion Program began in 1970 when the Canadian Parliament unanimously endorsed the White Paper that proposed the adoption of the metric International System of Units (SI) for Canada. In 1973, the Provincial Government established an Inter ministerial Metric Conversion Committee and, in 1976, a Metric Information Centre was formed to provide metric conversion information.

Role and Functions

Metric conversion information is provided to governments, industry and associations to assist the orderly conversion to SI at minimum cost and with the least inconvenience. Metric conversion information is supplied and updated through constant liaison with Metric Commission Canada. An ongoing check is also maintained on all sectors of the economy affected by conversion. The information obtained is provided to the public or industry, as requested.

Closure of Metric and Standards Office

The announcement in November 1983, that the Metric Office would be closing, caused a gradual cutoff in the number of enquiries received. Remaining calls continued to be handled until the office closed on March 31, 1984.

All metric materials stored in the office were distributed to such agencies and associations as the Consumers Association of Canada, schools, building supply dealers and ministries, in particular the Ministry of Health.

Staffing

Of the staff of six, three were reassigned other duties within the ministry and the positions of the other three became redundant as of March 31, 1984.

STANDARDS INFORMATION

The standards which evolved from a modest collection, as Canadian standards were first converted to metric, grew to a more comprehensive library, which was required to answer a wider range of metric and standards queries from ministries, Crown corporations, consultants, industry and associations. A complete set of International Organization of Standards (ISO) standards was added as the requests for this type of information increased. The ISO set, together with the remainder of the Canadian collection, was transferred to the Science and Technology Division of the Vancouver Public Library, with the exception of the Canadian General Standards Board (CGSB) set, which was transferred to the Purchasing Commission.

The transfer of the branch collection of standards will enable the Vancouver Public Library to provide more comprehensive information to industry, consultants and government in the Greater Vancouver area. Arrangements were also made for the ISO standards to be made available, on a loan basis, to other main libraries throughout the province. Discussions with the Standards Council of Canada have indicated that they are supportive of establishing regional information centres such as the Vancouver Public Library.

B.C. STANDARDS ADVISORY COMMITTEE

When the Standards Council of Canada met in Vancouver in June 1983, a committee was formed to plan an industry/public standards seminar. The planning committee evolved into a B.C. Standards Advisory Committee with two co-chairmen, one representing a manufacturer of electrical equipment and the other representing the Canadian Manufacturers' Association. One of the objectives of this committee is to provide a realistic industry, association and government voice in the development and use of standards in the province.

The SCC Standards Seminar provided a rare opportunity for local standards users to meet and converse with the members of the Council and heads of Canada's leading standards organizations. In the opinion of the Standards Council, it proved to be such a successful and profitable experience for all involved that it was decided to continue the practice of periodically meeting outside Ottawa, and the June 1984 meeting was held in Montreal.

GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT)

After the International General Agreement on Tariffs and Trade was signed, and the provinces became involved in monitoring of GATT, the Ministry of Industry and Small Business Development retained responsibility for policy matters and transferred the Technical Enquiry Point to the Metric Standards Branch. With the closing of the branch, the Technical Enquiry Point and the chairmanship of the Ad Hoc Committee on GATT Standards has been transferred to the Ministry of Industry and Small Business Development.

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